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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/049,695	09/23/2002	Toshiaki Hasegawa	3147/6	4660

7590 08/12/2004

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EXAMINER

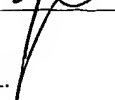
BARROW, JAMES G

ART UNIT	PAPER NUMBER
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3749

DATE MAILED: 08/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/049,695	Applicant(s) HASEGAWA ET AL. 	
	Examiner James G. Barrow	Art Unit 3749	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 5/5/2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
 4a) Of the above claim(s) 4,7,17,30-37,40 and 41 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5,6,10 and 14 is/are rejected.
- 7) ☒ Claim(s) 7-9,11-13,15,16 and 18-41 is/are objected to.
- 8) ☒ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>2/15/2002</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant has elected to prosecute the figures of Group II, Subcombination of A-2, and the claims (1), (2), 3, 5, 6, 8 to 13, (14), 15,16, 18 to 36, and 38 to 40 that the Applicant has selected to correspond to the elected figures. Regarding claim 30, only figure 23 is disclosed as having an "auxiliary combustion device" (L: 1-2), therefor claim 30 has been withdrawn from consideration. Regarding claim 31, only figures 6, 8, 10, 11, 12, and 19 correspond with the claim limitation "wherein said fuel gas introduction means introduces the fuel gas flow into said combustion area in parallel with the combustion air flow" (L: 1-3), therefor claim 31 is withdrawn from consideration. Regarding claim 32, only figures 17, 21, 22, and 23 correspond to the claim limitation "wherein said fuel gas introduction means introduces the fuel gas flow into said combustion area in a direction intersecting a direction of said combustion air flow" (L: 1-3), therefor claim 32 is withdrawn from further consideration. Regarding claim 33, none of elected figures correspond to the claim limitation "wherein said fuel gas introduction means introduces the fuel gas flow into said combustion area in a direction opposite against the combustion air flow" (L: 1-3), therefor claim 33 is withdrawn from consideration. Regarding claim 34, only figures 23, 24, 25, and 26 corresponds to the claim limitation "one of a tubular furnace, metal heating furnace, ceramic industrial kiln, metal melting furnace, gasification melting furnace, boiler and radiant tube" (L: 2-3), therefor claim 34 is withdrawn from consideration. Regarding claim 35, only non-elected figure 26 corresponds to the claim limitation "a subject to be heated is heated by flame

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which is produced by said combustion method as defined in claim 28" therefor claim 35 is withdrawn from consideration. Regarding claim 36, only figure 23 corresponds to the claim limitation "the subject to be heated is defined by a plurality of heated segments and said flame is generated between said segments" therefor claim 36 is withdrawn from consideration. Regarding claim 39, only figure 24 is disclosed as having a "fuel is mixed with said combustion air in a cold period so that a temperature of the combustion area is raised by an exothermic combustion reaction of said fuel and said combustion air", therefor claim 39 has been withdrawn from consideration. Regarding claim 40, only figure 26 corresponds to the claim limitation "a gas flow of said fuel gas is formed to move along a surface of the subject to be heated, so that a reduction combustion atmosphere at a low oxygen density is generated in vicinity of said subject", therefor claim 40 is withdrawn from consideration. These additional withdrawn claims mean that only claims (1), (2), 3, 5, 6, 8 to 13, (14), 15,16, 18 to 29, and 38 will be examined.

Specification

The disclosure is objected to because of the following informalities: In lines 20-31-16, of pages 8-9, the brief description of the figures should be broken out into single paragraphs.

Appropriate correction is required.

Claim Objections

Claims 3 and 4 are objected to because of the following informalities: The term "cooing" should be -cooling-. Appropriate correction is required.

Claim 13 is objected to because of the following informalities: The limitation "combustion air is pre-heated up to a high-temperature equal to or higher than 700 deg. C" (L: 6-7) is not supported by the specification. The specification supports "the combustion air is supplied to the combustion area through an air pre-heater which pre-heats the air to an extremely high-temperature range equal to or higher than 800 deg. C, preferably equal to or higher than 1000deg. C" (P: 14, L: 3-6). Appropriate correction is required.

Claims 7, 8, 11-13, and 21-41 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claims have not been further treated on the merits.

Claim 23 is objected to because of the following informalities: The limitation "wherein said mixed fluid introduced into said combustion area is mixed with said combustion air pre-heated up to a temperature equal to or higher than 700 deg. C" (L: 1-3) is not supported by the specification. The specification supports "the combustion air is supplied to the combustion area through an air pre-heater which pre-heats the air to an extremely high-temperature range equal to or higher than 800 deg. C, preferably equal to or higher than 1000deg. C" (P: 14, L: 3-6). Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 10, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Rampley et al (4,995,807). Rampley et al discloses a continuous fuel feeding means 151, combustion air supply means 146, mixing means (144, 147) for mixing the fuel with the combustion gas having a mixing area 142 positioned within to a fuel gas injection port 144 leading to the combustion area 120, and a combustion air supply means 118. Regarding claim 14, the apparatus practices the method.

Claims 1-3, 5, 6, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Akiyama et al (JP 06-193823). Akiyama et al discloses a heat storage low NOX burner having a fuel feeding means 4, a combustion air supply means 3, a combustion area 12, a mixing means and mixing area (see drawing 3), a combustion gas extraction 6, steam 8, a regenerator means 2 that cools to the combustion gas and heats the combustion gas by heating the air, forced circulation means 20 that through positive pressure past the venturi tube 5 to induce combustion gas extracted by the combustion gas extraction means and steam, and a port 5.

Allowable Subject Matter

Claims 9, 15, 16, and 18-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Wunning (6,033,208 and 4,877,396) disclose burner having

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recuperative means. Engelberg et al (6,250,917 and 5,876,197), Matuo (6,109,914), Nakamachi (5,931,653), Stultz et al (5,527,984), Tanaka et al (5,431,147), and Kobayashi (5,076,779) disclose furnaces having oscillating recuperative burners that mix air with fuel.

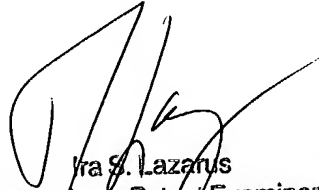
Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James G. Barrow whose telephone number is (703) 305-5427. The examiner can normally be reached on M-F, 9:30 A.M.-6:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ira S. Lazarus can be reached on (703) 308-1935. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


James Barrow


Ira S. Lazarus
Supervisory Patent Examiner
Group 1700